(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 February 2006 (09.02.2006)

PCT

(10) International Publication Number
WO 2006/013682 A1

(51) International Patent Classification[7]: F01L 9/04, F16K 31/06, H01F 7/14

(21) International Application Number: PCT/JP2005/011491

(22) International Filing Date: 16 June 2005 (16.06.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-228102 4 August 2004 (04.08.2004) JP

(71) Applicant *(for all designated States except US)*: **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MASAOKA, Toshika** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **ASANO, Masahiko** [JP/JP]; c/o TOYOTA JIDOSHA KABUSHIKI KAISHA, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

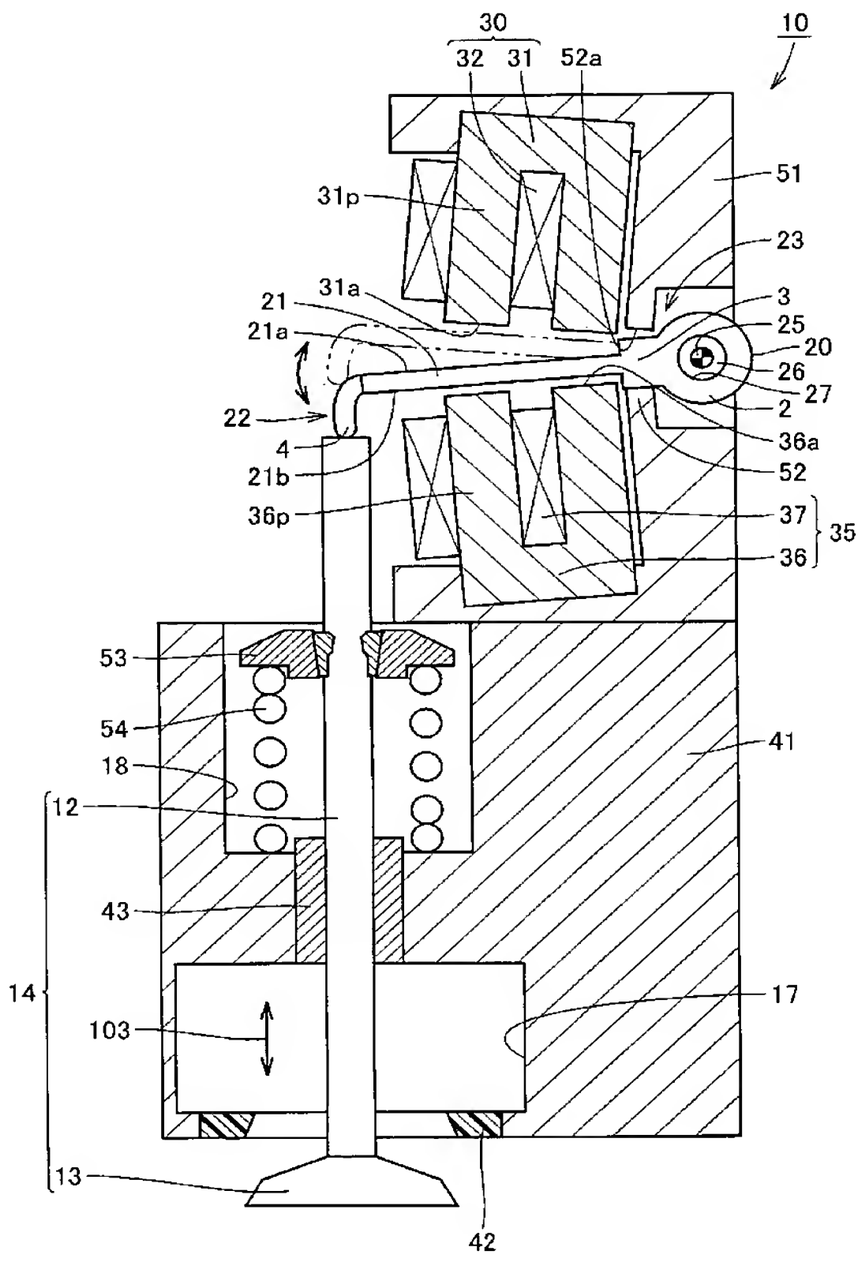
(74) Agents: **FUKAMI, Hisao** et al.; Fukami Patent Office, Mitsui Sumitomo Bank Minamimorimachi Bldg., 1-29, Minamimorimachi 2-chome, Kita-ku, Osaka-shi, Osaka 5300054 (JP).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,

[Continued on next page]

(54) Title: ELECTROMAGNETICALLY DRIVEN VALVE



(57) Abstract: An electromagnetically driven valve (10) includes a driven valve (14) having a stem (12) and carrying out reciprocating motion along a direction in which the stem (12) extends, a disc support base (51) having an abutment surface (52a), a disc (20) extending from one end (22) coupled to the stem (12) toward the other end (23) supported by the disc support base (51) so as to allow free oscillation of the disc, and an electromagnet (30, 35) applying electromagnetic force to the disc (20). The disc (20) has a root portion (3) formed at the other end (23), and an arm portion (21) formed from the root portion (3) to one end (22). The electromagnet (30, 35) has a surface (31a, 36a) facing the arm portion (21). When the disc (20) is attracted to the electromagnet (30, 35), the abutment surface (52a) abuts on the root portion (3) and a gap is created between the surface (31a, 36a) and the arm portion (21). With such a structure, excellent quietness and durability can be achieved and energy loss can be reduced.

WO 2006/013682 A1

SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.